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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,622	08/04/2006	Mark F. Sonnenschein	63344A	8246
109 7590 03/18/2011 The Dow Chemical Company P.O. BOX 1967 2040 Dow Center Midland, MI 48641				
EXAMINER				
ZHAO, XIAO SI				
ART UNIT		PAPER NUMBER		
1714				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

FFUIMPC@dow.com

# Office Action Summary

**Application No.**

10/588,622

**Applicant(s)**

SONNENSCHIN ET AL.

**Examiner**

XIAO ZHAO

**Art Unit**

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 recites the limitation "...so that the curing adhesive can be applied to the low surface energy substrate to make an effective adhesive". It is unclear to the Examiner what constitutes as an "effective adhesive". The term "effective adhesive" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Appropriate correction or clarification is required. For the purpose of Examination, "effective adhesive" is considered as an adhesive that can be bond to a substrate.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims 1-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonnenschein et al. (US 2002/0033227) in view of Lassila et al. (US 2005/0176605).**

*Per independent claims 1, 7 and 9:*

Sonnenschein et al. teach a polymerizable adhesive composition ([0013]) that is a 2-part formulation ([0055]). The first part contains the complexes of the composition, and the other part contains the initiator ([0055]). Specifically, Sonnenschein et al. disclose an embodiment that utilizes an amine organoborane complex, a two-part adhesive with acrylic resin with an initiator ([0083]-[0085]). In the specific embodiment above, Sonnenschein et al. do not disclose that the complex is a trialkylborane-organonitrogen complex. However, the reference does disclose that the amine organoborane complex can be a trialkylborane-organonitrogen complex ([0011]). It would have been obvious to a skilled artisan to use said trialkylborane-organonitrogen complex as disclosed by the reference with a reasonable expectation of success.

Furthermore, the reference discloses that water can be added as a solvent in order for the composition to be used as a coating.

Sonnenschein et al. do not disclose a neutral or basic surfactant is used with the composition in the range of from about 0.5 to 25 weight percent and the concentration is sufficient to increase stability of the protected alkylborane complex in water.

Lassila et al. disclose that the ability to reduce surface tension is of great importance in adhesives and that surfactants are generally used to reduce surface tension ([0003]). Specifically, the surfactant can be polyethylene glycol or poly(ethylene glycol-co-propylene glycol) ([0071]). Since this surfactant is the same surfactant disclosed by the Applicants (see instant claim 4), it is also a neutral or basic surfactant.

It would have been obvious to a skilled artisan to add polyethylene glycol, as disclosed by Lassila et al., as a neutral or basic surfactant to the composition of Sonnenschein et al. One would have been motivated to do so because Lassila et al. teach that lowering the surface tension (by adding surfactants) can provide better substrate wetting and also can reduce the problem of bubble generation or foaming during spray applications (see Lassila, [0003]).

Sonnenschein/Lassila do not disclose that the concentration of the surfactant is in the range of from about 0.5 weight percent to 25 weight percent. However, Lassila et al. disclose that the surfactants help to reduce the interfacial, or surface, tension of the solution (see above). The amount of surfactant that is included in the solution determines the amount of surface tension reduction that is achieved. Thus, the

concentration of surfactants in the solution is a result-effective variable. It would have been obvious to a skilled artisan to optimize the concentration of surfactants in the solution of Sonnenschein/Lassila in order to achieve a desired surface tension reduction and increased shelf-stability. It is well established that the optimization of result-effective variables only require ordinary skill in the art.

With regards to the limitation "and the concentration is sufficient to increase stability of the protected alkylborane complex in water". Since Sonnenschein/Lassila disclose each and every limitation as instantly recited in claims 1, 7 and 9 and the same surfactant as the instant invention, it is also capable of sufficiently increasing the stability of the protected alkylborane complex in water.

Per claim 2, Sonnenschein et al. teach that the composition contains trialkylborane-organonitrogen complex ([0011]) and poly(methylmethacrylate) ([0085]).

Per claim 3, Sonnenschein et al. teach that the thixotropic agent is poly(methyl methacrylate) ([0085]).

Per claim 4, Lassila et al. disclose that the surfactant is polyethylene glycol (see above). It has already been established that it would have been obvious to use the surfactant of Lassila et al. with Sonnenschein et al. (see rejection for claim 1).

Per claim 5, Sonnenschein et al. teach that the second part of the formulation contains methylmethacrylate and acrylic acid (see claim 1).

Per claim 6, Sonnenschein et al. teach that the second part of the formulation contains methylmethacrylate and acrylic acid (see claim 1).

Per claim 8, pigments can be added to the composition ([0068]).

Per claim 11, Sonnenschein et al. disclose that the protected alkylborane complex is a trialkylborane-organonitrogen complex ([0011]).

Per claim 12, the composition is a cured adhesive ([0013]).

**6. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonnenschein et al. (US 2002/0033227) in view of Piechocki et al. (US 6,271,287).**

Per independent claim 13:

Sonnenschein et al. teach a method of forming a polymerizable adhesive composition ([0013]) that is a 2-part formulation ([0055]). The first part contains the complexes of the composition, and the other part contains the initiator ([0055]). Specifically, Sonnenschein et al. disclose an embodiment that utilizes an amine organoborane complex, a two-part adhesive with acrylic resin with an initiator ([0083]-[0085]). In the specific embodiment above, Sonnenschein et al. do not disclose that the complex is a trialkylborane-organonitrogen complex. However, the reference does disclose that the amine organoborane complex can be a trialkylborane-organonitrogen complex ([0011]). It would have been obvious to a skilled artisan to use said trialkylborane-organonitrogen complex as disclosed by the reference with a reasonable

expectation of success. Furthermore, the reference discloses that water can be added as a solvent in order for the composition to be used as a coating. The reference also disclose contacting the components of the adhesive composition and applying the adhesive to substrates ([0013]). The substrate is low surface energy substrate ([0014]).

Sonnenschein et al. do not disclose a neutral or basic surfactant is used with the composition wherein concentration of the surfactant in the surfactant-stabilized aqueous dispersion of the trialkylborane-organonitrogen complex is in the range of from about 0.5-25 weight percent and the concentration is sufficient to increase stability of the trialkylborane-organonitrogen complex in water so that the curing adhesive can be applied to the low surface energy substrate to make an effective adhesive.

Piechocki et al. disclose an epoxy resin, a common adhesive, aqueous dispersion (see title) that includes surfactants in order to achieve unusually long shelf-stability of the solution (see abstract). Specifically, the surfactant is polyethylene glycol (col. 4, 44-45 ). Since this surfactant is the same surfactant disclosed by the Applicants (see instant claim 4), it is also a neutral or basic surfactant.

It would have been obvious to a skilled artisan to add polyethylene glycol, as disclosed by Piechocki et al., as a neutral or basic surfactant to the composition of Sonnenschein et al. One would have been motivated to do so because Piechocki et al. teach that the addition of a PEG surfactant can increase the shelf-stability of the composition (see above).

Sonnenschein/Piechocki do not disclose that the concentration of the surfactant is in the range of from about 0.5 weight percent to 25 weight percent. However, Piechocki et al. disclose that the surfactants help to increase the shelf-stability of the solution and also affects reduce the interfacial, or surface, tension of the solution (col. 4, 63-65). The amount of surfactant that is included in the solution determines the amount of surface tension reduction and the amount of shelf-stability that is achieved. Thus, the concentration of surfactants in the solution is a result-effective variable. It would have been obvious to a skilled artisan to optimize the concentration of surfactants in the solution of Sonnenschein/Piechocki in order to achieve a desired surface tension reduction and increased shelf-stability. It is well established that the optimization of result-effective variables only require ordinary skill in the art.

Per claim 14, Sonnenschein et al. disclose that the curing and contacting are done concurrently ([0013]).

Per claim 15, Sonnenschein et al. disclose that the substrate is polypropylene ([0067]).

**7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonnenschein et al. (US 2002/0033227) in view of Piechocki et al. (US 6,271,287) and in further view of Sonnenschein et al. (US 2004/0259990).**

Sonnenschein('227)/Piechocki teach all the limitations of claim 13 and that a low surface energy polypropylene substrate is used. Sonnenschein('227)/ Piechocki do not specify the tacticity of the polypropylene substrate.

Isotactic polypropylene is a low surface energy substrate. This is taught by Sonnenschein et al. ('990) wherein the reference teach that isotactic polypropylene is a low surface energy substrate (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use an isotactic polypropylene as the low surface energy substrate taught by Sonnenschein('227)/ Piechocki. One would have been motivated to choose isotactic as the tacticity of polypropylene because the reference disclose that a low surface energy substrate needs to be used.

### ***Response to Arguments***

8. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to XIAO ZHAO whose telephone number is (571)270-5343. The examiner can normally be reached on Monday to Friday 8:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Xiao S Zhao/  
Examiner, Art Unit 1714  
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